

no-watashi—basket-crossing—is much used in these provinces. A sort of wicker cradle is suspended on hempen ropes slung across the valley, and is drawn by lines to one side or the other, or, as is more usually the case, the peasant crosses without assistance. Entering the cradle, he seizes the ropes above with his hands, and by a series of dexterous jerks, needing considerable practice for their due accomplishment, takes himself and the cage across. The great danger seems to be that of getting the cradle from under him, and thus leaving his body suspended in mid-air. His struggles are represented no less quaintly than vigorously in a drawing by Hokusai, to be found in the 13th volume of his *Manguwa*, or Rough Sketches.

A distinguishing feature of the book is the elaborate account given of the principal mountains, most of which have been ascended by the authors. Fuji, of course, is the highest, Dr. Rein making it 12,280 feet, Mr. Stewart 12,365 feet. The curiously jagged outline of the comparatively narrow rim of the crater shows doubtless that the broad deep cavity, of which the diameter is about 1500 feet, and the depth about 550 feet, was usually full of boiling lava, spurted up from time to time in the manner described by Miss Bird in her graphic description of the great volcanic districts of Kilauea and Mauna Loa. It is not mentioned that the two wells on the summit, on the edge almost of the crater itself, the Famous Golden Water and the Famous Silver Water, derive their supply from hoards of snow preserved by overlying masses of wind-heaped scoriae, and volcanic dust from perishing under the fiery rays of the summer sun. One of the most interesting of the many peaks which Messrs. Satow and Hawes are the only Europeans who have ascended, is Mount Ganjiu, of which the shapely outlines rise in beautiful logarithmic curves high over the plains of Nambu. The mountain consists of three volcanic cone-frusta "telescoped" into each other. The lower cone is of course the oldest, the rim of its crater being still distinct at a height of about 500 feet. A smaller cone about 600 feet high, rises within this, the rim of the crater of which is nearly equally distinct, and a third and smallest cone tops all, having a height of not more than 100 feet, and showing a crater at its summit, from which jets of steam still issue.

It is noteworthy that in Japan the names of rivers, capes, plains, and villages are usually pure Japanese, those of mountains more commonly Chinese. Some of the place names in the northern part of the main island have a distinctly Aino character, for instance, such a name as Namakunai, and many of the names ending in "bē," a corruption of "betsu," the Aino word for river.

Two capital maps accompany the book, which the stay-at-home reader will find as full of curious lore as the traveller of valuable information.

FREDK. V. DICKINS

OUR BOOK SHELF

Studies in Nidderdale. By Joseph Lucas, F.G.S., F.M.S., Telford Medallist of the Institution of Civil Engineers, Associate of the Institute of Surveyors. (London : Elliot Stock. Pateley Bridge : Thomas Thorpe.)

THIS book is the result of notes and observations other than geological, made in Nidderdale during the progress

of the Government Geological Survey of that district, between the years 1867 and 1872.

Nidderdale is a remote pastoral valley, formed by the River Nidd, which takes its rise near the mountains of Great and Little Whernside, and which, after a course of about thirty-five miles, joins the Ouse near York.

The basin of the Nidd, above Hampsthwaite, includes an area of eighty square miles, and for sixteen miles from Great Whernside, the valley proper is nowhere more than one mile wide from ridge to ridge, and is from 500 to 800 feet deep, forming as it were a deep groove in the vast easterly sloping heather-covered moorland.

After a few introductory remarks upon the geology and geography of Nidderdale, Mr. Lucas deals with the cattle, sheep, and other matters connected with the farm, including instructive and exhaustive discussions upon the various names. In the dairy department we have the *kern* (old Norse, *kirna*—a churn), now a revolving barrel or tub, on a horizontal axis, the *sile* (old Norse, *sahl*—a sieve), and *sine*, Saxon *sihan*—to strain; and the "lile roond thithel" for stirring cream. The old cheese press is described in detail, and there is an excellent drawing of a very old form of that dairy implement, very like such as we remember to have seen long ago in remote rural districts in the north. Then there is a very interesting chapter upon the farm itself, in which Mr. Lucas introduces a farmer speaking in the dialect, and describing by their appropriate names and uses, the various buildings, fields, and animals to be found upon his farm; interspersed with these the author has put the various Norse, Anglo-Saxon, or Celtic words, from which many words in the folk speech have been derived, so that we have a means of tracing the sources of the dialect while we are becoming acquainted with its local use.

Mr. Lucas must have had opportunities such as very few others could have had, to trace out the natural science of the district, and as the passage will give a good idea of concise and clear style in which the book is written, we give an extract from the chapter on "Vestiges of the Ancient Forest."

"Nidderdale and its moors have formerly been covered by an extensive forest. Many trees lie buried in the peat upon the moors. In the thousands of sections made by little water-courses, the birch appears almost everywhere predominant. Hazel 'sealh' (willows), thorn, oaks, &c., also occur, but the birch must have formed a thick and almost universal forest by itself, such as may be seen on the west coast of Norway at the present day. The upper parts of the moorland gills, and much of what is now the moors, must formerly have made a beautiful appearance with its light gauze-like forest of birch and mountain-ash. The last surviving example on any considerable scale is present in Birk Gill, a tributary of the River Burn. The run of the Gill is north-west to south-east. The Gill is about 400 feet deep at its mouth, and half a mile wide from ridge to ridge. Like all other valleys of the same elevation in these hills, it is boat-shaped in section, the beck running in a deep ravine at the bottom. The sides of the hills are wild heathery moorland, crowned with fine lines of crags down to the edge of this ravine in which the native forest is preserved. There is no cultivation in the Gill, the bottom of which is about 600 feet above the sea at its mouth. The belt of wood clothes the sides for 200 feet, or up to 800 feet near its mouth, and ends where the stream reaches 900 feet in a distance of rather more than a mile. Above this the stream is called Barnley Beck. The wood consists of mountain ash, alder, oak, ash, birch, holly, and thorn, running above the edge of the cleft with a delightfully irregular and feathery margin on the ling covered moor." Subjoined to this is an elaborate table giving the aspect, height, and soil of the various trees found in this valley. A chapter is devoted to the modern botany of the valley, upon which there are also valuable notes in the introduction by Mr. J. G.

Baker, F.R.S., of Kew Gardens. Mr. Lucas is by no means backward in acknowledging by whom he has been aided in the completion of the work, and amongst others there are numerous and valuable contributions by Mr. J. R. Dakyns, M.A., Cantab. (of H. M. Geological Survey), both in the foot-notes and in the text.

Notwithstanding this, however, the book is an original work, everywhere bearing abundant evidence that the materials have not been compiled, but in great part collected upon the spot, and carefully worked out by the author himself. And as there are many secluded valleys in Cumberland, Westmoreland, and Yorkshire, in which the customs, manners, and folk-speech differ very little from that of Nidderdale, we think the volume deserves a much wider circulation than in the district of that valley from which it takes its name. Six of the concluding chapters are devoted to the birds of Nidderdale. These chapters on natural history are the most pleasing in the book, and contain information respecting the distribution of many birds which is altogether new. After these there is a well-told story in the dialect ("Dicky and Micky Date") by Thomas Thorpe.

Probably the most valuable, and certainly the most laborious portion of the work, is the glossary of the dialects of Nidderdale, with which it concludes.

Local glossaries no doubt there are without number, of the northern dialects, but we have never before seen one which has traced with such clearness, both from its use and derivation, each word to its source. A residence of over forty years in some of those remote regions in which a corresponding dialect is spoken, enables us to testify that Mr. Lucas has been wonderfully accurate and exhaustive in laying hold of the vocables of the district; and the pains and skill with which he has traced them through the Norse and other cognate languages, must be seen before they can be properly understood. T. E.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of rejected manuscripts. No notice is taken of anonymous communications.*]

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

The Sun-spot Period

THE sight of my *bête noire*, that part of Wolf's sun-spot curve lying between the years 1766 and 1799, so clearly plotted in the communication by Prof. Stanley Jeavons, on "The Solar-Commercial Cycle" (NATURE, vol. xxvi. pp. 226-28), impels me to offer some remarks having special reference to solar periodicity at that time.

In a paper read at the meeting of the British Association in York last year, I ascribed the sun-spots to planetary tides in the solar atmosphere. It is not pretended that what was advanced amounted to demonstration, but the assumption had this practical result—it led me to the conclusion that the sun-spot maxima and minima, recognised in what is known as the sun-spot period, are, on the whole, determined by the relative positions of the planets Venus, Earth, and Jupiter. The maxima are nearly always associated with configurations in which Venus and Earth in conjunction or opposition, have Jupiter in or near syzygy or quadrature; while the minima are even more certainly associated with configurations in which Venus and Earth in conjunction or opposition, have Jupiter in or near the octant.

There are, however, significant deviations from this general law, and the maximum to which Wolf assigns the date 1788·1 occurs at a time when the law would give a minimum. Now it may be admitted, that at times special conditions prevail, arising from changes within the sun itself, or from the advent of material agglomerations foreign to our system. I prefer, nevertheless, to assume for the present, that the explanation of such periodicity as has been established is within the resources of a planetary hypothesis. Accepting the sun-spot record as read for

us by Prof. Wolf, because we have nothing better, it is inferred that the apparent anomalies of the period in question are due to exceptional planetary configurations.

The following statement shows how lamentably observation and theory are at variance, in regard to the sun-spot numbers, near the dates 1778 and 1789:—

Years of Maximum Annual Sun-Spot Numbers				
	Observation			
1761	1769	1778	1789	1804
Hypothesis				
1761	1771	1783	1794	1804

The remarkable series of corn-prices, as given by Prof. Jeavons, however shows maxima so fairly in accord with the hypothetical maxima that I am tempted to quote them:—

Years of Maximum Corn-price at Delhi				
1763	1773	1783	1792	1803

If this relation is anything more than a coincidence, an important question arises. Are we to consider the sun-spot record defective, and reject the maxima of 1778 and 1789, because they cannot be traced in the corn-prices? Not necessarily, it seems to me. The sun-spot record may not be reliable, and with its revision difficulties may vanish, but there is something very substantial about the maximum of 1789, and it must be remembered that it is one thing to measure a sun-spot, and quite another thing to use a sun-spot as a measure. The sun-spot tells of solar disturbance, but the attendant changes in solar radiant forces will be changes in quality as well as in quantity, and it may be taken for granted that there are solar periods that are not to be found in the sun-spot numbers directly. One outcome of the researches of Dr. Köppen has been the recognition of what is called the period of the "Umkehrung," or inversion, so named because the more usual relations of sun-spots and air temperatures are supposed to be reversed during this particular period, which lies between the years 1770 and 1816, or thereabouts. Double-edged weapons are, however, dangerous, and must be used with caution.

Sun-spot measurement itself is a somewhat arbitrary process. The "relative number" for a given day is ten times the number of groups, plus the number of individual spots; while the method initiated by the Kew observers, and now adopted at Greenwich, gives "spotted area," that is, the proportion of the sun's surface covered by such spots as may be visible on that day. It would be interesting to compare the positions of the great spots seen in April last, as given on the annual sun-spot rolls at Zürich and Greenwich respectively. Moreover, certain well-marked distinctions in the character of the disturbance have no place, or next to none, in sun-spot measure—the faculae are ignored, while umbra and penumbra are lumped together.

It should be remarked that observation and hypothesis agree in the total number of periods, so that, the length of the mean sun-spot period remains unaltered, unless it is decided that certain observed maxima may be taken in addition to the hypothetical maxima, and not as replacing them. The planetary hypothesis requires that the sun-spot series shall be considered as a compound series, representing a number of more or less important series of planetary periods, and it is to be expected that at times there will be a difficulty in tracing any dominant series of periods, whether primary or derivative.

It seems to me that too much importance is apt to be attached to the mean sun-spot period, seeing that its occurrence is exceptional, and the departure from it very considerable.

That these observations should be inconclusive is a matter of course, but my purpose will be served, if they tend to produce the impression, that there may be no real solution of continuity in the relation between the sun-spot numbers and the particular series of planetary periods that I believe to give "the sun-spot period" a rational basis.

F. B. EDMONDS
72, Portsdown Road, London, W., July 14

Messrs. McAlpine's Atlases

WILL you allow me space in your columns to make a few remarks upon the "Biological Atlas" of Messrs. D. and A. McAlpine, and the "Zoological Atlases" of the first of these gentlemen?

Mr. D. McAlpine was, some three or four years ago, a student